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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/023,561	12/18/2001	Seppo Rousu	872.0106.U1(US)	2675
29683	7590	08/21/2006	EXAMINER	
HARRINGTON & SMITH, LLP 4 RESEARCH DRIVE SHELTON, CT 06484-6212			NGUYEN, DAVID Q	
			ART UNIT	PAPER NUMBER
			2617	

DATE MAILED: 08/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/023,561	<b>Applicant(s)</b> ROUSU, SEPPO	
	<b>Examiner</b> David Q. Nguyen	<b>Art Unit</b> 2617	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 04 August 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-3,5-14,16-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3,5-14 and 16-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION*****Response to Arguments***

1. Applicant's arguments filed 08/04/06 have been fully considered but they are not persuasive.

In response to applicants' Remarks, applicants argue: "Wilcox et al. do not disclose the claimed method wherein at least two modes operate within at least one common range frequencies, including electronically detuning the resonance of a second antenna of a mobile station such that the resonance of the second antenna is mis-matched to the first antenna so as to reduce coupling of the transmitted signal from the first antenna into the second antenna, wherein the step of detuning comprising varying an impedance of at least one component that forms a part of the second antenna circuit."

Examiner respectfully disagrees. Fig. 2 of Wilcox's reference shows a **multi-mode mobile station** comprising antenna 214, antenna 224, and the signal circuits 210 and 220. The signal circuits 210, 220 can be transmitters, receivers, or transceiver for radios, cellular telephone radios, walkie-talkies, GPS system or other circuit that transmit and/or receive a signal over an antenna (see col. 4, lines 10-14). Wilcox also teaches: "the second signal circuit 220 can generate signals in multiple frequency bands, and the first parallel circuit 212 can maximize the antenna to antenna isolation. The first parallel circuit 212 can include an impedance matching circuit or other tuning circuit. Alternatively, the first parallel impedance matching circuit may be used to indirectly or directly correct the impedance mismatch between the second antenna 224 and the second signal circuit 220" (see col. 4, lines 32-40). Optionally, the multiple antenna system 200 can include a second parallel circuit 222 selectively connectable to the second signal path 226.

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The second parallel circuit 222 can reduce the coupling between the first and second antennas 14, 224 by presenting a high insertion loss between the antenna 224 and the signal circuit 220 when the signal circuit 210 is in use and a low insertion loss between the same points when the signal circuit 220 is in use. It is preferable that the first parallel circuit 212 be connected to the first signal path 216 near the first antenna 214 and create a termination impedance at the input to the first antenna 214 equivalent to an open circuit when the second signal circuit is in use. The first parallel circuit 212 can include active or passive components. Further, the first parallel circuit 212 can be used to improve the impedance match between the second antenna 224 and the second signal source 220. Because the two antennas 214, 224 are in close proximity with each other, the impedance match of the second antenna 224 is affected by the presence of the first antenna 214. The first parallel circuit 212 can create a terminating impedance in the first antenna 214 that adjusts the impedance match in the second antenna 224. It is preferred that active controls be used to perform this function” (see col. 4, lines 41-64).

It is apparent that Wilcox teaches electronically detuning the resonance of a second antenna of a mobile station such that the resonance of the second antenna is mis-matched to the first antenna so as to reduce coupling of the transmitted signal from the first antenna into the second antenna.

The admitted prior art shows and discloses a method for operating a **multi-mode mobile station, wherein at least two modes operate within at least one common range of frequencies** (see fig. 2 and page1 line 28 to page 2, line 1), comprising: transmitting a signal from a first antenna circuit of the mobile station in the common range of frequencies (see fig. 2 and page1 line 28 to page 2, line 1). Therefore, the Wilcox’s method for operating a multi-mode

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mobile station combined with the admitted prior art's method for operating a multi-mode mobile station teaches the claimed method wherein at least two modes operate within at least one common range frequencies, including electronically detuning the resonance of a second antenna of a mobile station such that the resonance of the second antenna is mis-matched to the first antenna so as to reduce coupling of the transmitted signal from the first antenna into the second antenna, wherein the step of detuning comprising varying an impedance of at least one component that forms a part of the second antenna circuit.

Applicants also argue: "The Trikha et al. reference does not provide any suggestion regarding how to solve the afore-referenced problem addressed by the subject claims as Trikha et al. not even appear to be aware of a problem occurring when two antenna are functioning in, for example, the same frequency band with one in the near field of the other."

Examiner disagrees. The Wilcox's method for operating a multi-mode mobile station combined with the admitted prior art's method for operating a multi-mode mobile station teaches all limitations of independent claims 1 and 12. The Trikha et al. reference teaches a multi-mode mobile station selectively transmitting and/or receiving RF signals in two frequency bands and in two modes of operation comprises a stripline, PIN diode, variable capacitance, FET diode, etc. (see col. 2, lines 20-42 and figs. 1-4) as claimed in application's dependent claims 4-11 and 15-22. Therefore, the multi-mode mobile station of Trikha et al combined with the multi-mode mobile station of the admitted prior art in view of Wilcox teaches all limitations of applications' dependent claims 5-9 and 16-20.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-3 and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art in view of Wilcox et al. (US 6,920,315 B1).

Regarding claims 1 and 12, The admitted prior art shows and discloses a method for operating a multi-mode mobile station, wherein at least two modes operate within at least one common range of frequencies (see fig. 2 and page1 line 28 to page 2, line 1), comprising: transmitting a signal from a first antenna circuit of the mobile station in the common range of frequencies (see fig. 2 and page1 line 28 to page 2, line 1). The admitted prior art does not disclose the mobile station comprising at least two antennas; a controller, responsive to a first one of said transmitter circuits transmitting, for electronically detuning the resonance of a second antenna of the mobile station such that the resonance of the second antenna is mis-matched to the first antenna so as to reduce coupling of the transmitted signal from the first antenna into the second antenna. However, Wilcox et al. discloses the mobile station comprising at least two antennas (see abstract and fig. 2); a controller, responsive to a first one of said transmitter circuits transmitting, for electronically detuning the resonance of a second antenna of the mobile station such that the resonance of the second antenna is mis-matched to the first antenna so as to reduce coupling of the transmitted signal from the first antenna into the second antenna (see abstract and col. 5, lines 14-55). Therefore, it would have been obvious to one of ordinary skill in the art at

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the time the invention was made to modify the above teaching of Wilcox et al. to the admitted prior art so that dual mode cellular phones are able to operate in two or more overlapping frequency bands.

Regarding claims 2-3 and 13-14, the admitted prior art also shows wherein the common range of frequencies comprises 1900 MHz; the common range of frequencies comprises 850 MHz (see fig. 2 and page 1 line 28 to page 2, line 1).

3. Claims 5-9 and 16-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art in view of Wilcox et al. (US 6,920,315 B1) and further in view of Trikha et al. (US 6,072,993).

Regarding claims 5-9 and 16-20, the method of the admitted prior art in view of Wilcox et al. does not mention wherein the at least one component is comprised of a strip line; wherein the at least one component is comprised of a PIN diode; wherein the at least one component is comprised of a variable capacitance; wherein the at least one component is comprised of a FET diode; wherein the at least one component is comprised of an active component that is put into a passive state. However, Trikha et al. discloses wherein the at least one component is comprised of a strip line; wherein the at least one component is comprised of a PIN diode; wherein the at least one component is comprised of a variable capacitance; wherein the at least one component is comprised of a FET diode; wherein the at least one component is comprised of an active component that is put into a passive state (see col. 2, lines 20-42 and fig. 1-4 and its description). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the above teaching of Trikha et al. to the admitted prior art in view of

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Wilcox et al. so that dual mode cellular phones can be designed using electronic parts or chips as desired by designer.

Regarding claims 10-11 and 21-22, the method of the admitted prior art in view of Wilcox et al. does not mention wherein the step of detuning comprises operating at least one switch for adding a length of strip line to, or for subtracting a length of strip line from, the second antenna circuit; wherein the step of detuning comprises operating at least one switch for connecting a length of strip line to ground, or for disconnecting a length of strip line from ground. Trikha et al. discloses wherein the step of detuning comprises operating at least one switch for adding a length of strip line to, or for subtracting a length of strip line from, the second antenna circuit (see col. 2, lines 20-42 and fig. 1-4 and description); wherein the step of detuning comprises operating at least one switch for connecting a length of strip line to ground, or for disconnecting a length of strip line from ground (see col. 2, lines 20-42 and fig. 1-4 and description of Trikha et al). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the above teaching of Trikha et al. to the admitted prior art in view of Wilcox et al. so that the dual mode cellular phones can be designed using electronic parts or chips as desired by designer.

### ***Conclusion***

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Q. Nguyen whose telephone number is 571-272-7844.

The examiner can normally be reached on 8:30AM-5:30PM.



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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, JOSEPH H. FEILD can be reached on (571)272-4090. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



David Q Nguyen  
Examiner  
Art Unit 2617